CLAIMS

What is claimed is:

1. An isolated polynucleotide comprising a nucleotide sequence encoding a first polypeptide of at least 100 amino acids that has at least 80% identity based on the Clustal method of alignment when compared to a polypeptide selected from the group consisting of a *Momordica charantia* thioredoxin polypeptide of SEQ ID NO:2, a *Catalpa speciosa* thioredoxin polypeptide of SEQ ID NO:4, a soybean thioredoxin polypeptide of SEQ ID NO:6, a soybean thioredoxin polypeptide of SEQ ID NO:8 and a *Vernonia* thioredoxin polypeptide of SEQ ID NO:10.

2. An isolated polynucleotide comprising the complement of polynucleotide of Claim 1.

3. The isolated polynucleotide of Claim 1, wherein the nucleotide sequence comprises a nucleic acid sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7 and 9 that codes for the polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8 and 10.

4. The isolated polynucleotide of Claim 1 which is DNA.

5. The isolated polynucleotide of Claim 1 which is RNA.

6. A chimeric gene comprising the isolated polynucleotide of Claim 1 or Claim 2 operably linked to suitable regulatory sequences.

7. An isolated host cell comprising the chimeric gene of Claim 6.

8. An isolated host cell comprising an isolated polynucleotide of Claim 1.

9. The isolated host cell of Claim 8, wherein the host cell is yeast.

10. The isolated host cell of Claim 8, wherein the host cell is a bacterial cell.

11. The isolated host cell of Claim 8, wherein the host cell is a plant cell.

12. A virus comprising the isolated polynucleotide of Claim 1.

13. A process for producing an isolated host cell comprising the chimeric gene of claim 6, the process comprising either transforming or transfecting an isolated compatible host cell with the chimeric gene of Claim 6.

14. A thioredoxin polypeptide of at least 100 amino acids comprising at least 80% homology based on the Clustal method of alignment compared to a polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8 and 10.

15. A method of selecting an isolated polynucleotide that affects the level of expression of a thioredoxin polypeptide in a plant cell, the method comprising the steps of:

constructing an isolated polynucleotide comprising a nucleotide sequence of at least one of 30 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9 and the complement of such nucleotide sequences;

introducing the isolated polynucleotide into a plant cell;

measuring the level of thioredoxin polypeptide in the plant cell containing the polynucleotide; and

comparing the level of thioredoxin polypeptide in the plant cell containing the isolated polynucleotide with the level of thioredoxin polypeptide in a plant cell that does not contain the polynucleotide.

16. The method of Claim 15 wherein the isolated polynucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7 and 9 that codes for the polypeptide selected from the group consisting of SEQ ID NO:2, 4, 6, 8 and 10.

17. The method of Claim 15 wherein the isolated polynucleotide is DNA.

18. The method of Claim 15 wherein the isolated polynucleotide is RNA.

19. The method of Claim 15 wherein the isolated polynucleotide is a chimeric gene comprising the nucleotide sequence operably linked to suitable regulatory sequences.

20. A method of selecting an isolated polynucleotide that affects the level of expression of thioredoxin polypeptide in a plant cell, the method comprising the steps of:

constructing the isolated polynucleotide of claim 1;

introducing the isolated polynucleotide into a plant cell;

measuring the level of thioredoxin polypeptide in the plant cell containing the polynucleotide; and

comparing the level of thioredoxin polypeptide in the plant cell containing the isolated polynucleotide with the level of thioredoxin polypeptide in a plant cell that does not contain the polynucleotide.

21. A method of obtaining a nucleic acid fragment encoding a substantial portion of a thioredoxin gene comprising the steps of:

synthesizing an oligonucleotide primer comprising a nucleotide sequence of at least one of 40 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9 and the complement of such nucleotide sequences; and

amplifying a nucleic acid sequence using the oligonucleotide primer.

22. A method of obtaining a nucleic acid fragment encoding all or a substantial portion of the amino acid sequence encoding a thioredoxin protein comprising the steps of:

probing a cDNA or genomic library with an isolated polynucleotide comprising a nucleotide sequence of at least one of 30 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NO:1, 3, 5, 7, 9 and the complement of such nucleotide sequences;

identifying a DNA clone that hybridizes with the isolated polynucleotide;

isolating the identified DNA clone; and

sequencing the cDNA or genomic fragment that comprises the isolated DNA clone.

23. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the *Momordica charantia* thioredoxin polypeptide of SEQ ID NO:2.

24. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the *Catakoa speciosa* thioredoxin polypeptide of SEQ ID NO:4.

25. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the soybean thioredoxin polypeptide of SEQ ID NO:6.

26. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the soybean thioredoxin polypeptide of SEQ ID NO:8.

27. The isolated polynucleotide of Claim 1, wherein the first polypeptide is compared to the *Vernonia* thioredoxin polypeptide of SEQ ID NO:10.